IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant :	Haci. M. et al.	Art Unit :	3672
Serial No.:	10/612,277	Examiner :	Bates, Z. W.
		Docket No.:	P 061459 303137

Filed : 7/1/2003
Title : CONTINUOUS ON BOTTOM DIRECTIONAL DRILLING METHOD AND SYSTEM

Mail Stop Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF TOMMY M. WARREN

Sir:

Tommy M. Warren declares that:

I have a Bachelor of Science degree in Mineral Engineering and a Master of Science degree in Mineral Engineering from the University of Alabama. I have a total of 32 years experience as a drilling and operations engineer, and as a research engineer in the oil and gas production industry. I worked for 23 years as a research engineer and supervisor at the Amoco Technology Center in the field of well drilling for petroleum exploration and production. I am currently employed as Director of Casing Drilling Research and Engineering for Tesco Corporation, which has no business relationship with the assignee of the present patent application. I am a named inventor in more than thirty United States patents relating to the technical field of wellbore drilling, including in particular U.S. Patent No. 4,854,397 entitled, "System for Directional Drilling and Related Method of Use", which deals specifically with techniques for drilling with so-called "steerable motors." I have read the captioned patent application and the Office Action dated November 29, 2005, as well as Eppink et al. (U.S. Patent No. 6,494,272) cited by the Examiner in the Office Action and am familiar with the subject matter thereof.

To my knowledge, directional drilling using steerable motor systems known in the art prior to the invention disclosed and claimed in the captioned patent application include the following. The steerable motor can be operated in one of two distinct modes. The first such mode is known as "rotary drilling mode", or "rotating mode." In rotating mode, the entire drill string, of which the steerable motor forms close to a lowermost component in the wellbore, is rotated from the Earth's surface by equipment on a drilling rig, such as a Kelly/bushing-rotary table or a top drive. The steerable motor housing has a small bend in it, which in rotating mode has no average effect on the mechanics of drilling the wellbore, and in general, the wellbore proceeds along its existing trajectory. In the other mode, the so-called "sliding mode", rotation of the drill string from the Earth's surface is stopped. In sliding mode, the only rotation of the drill bit is the rotation imparted by the motor itself. Thus, drilling the wellbore is advanced by reason of the rotation of the drill bit imparted by the motor. However, in sliding mode the bend in the motor housing does affect the trajectory of the wellbore. The wellbore trajectory tends to move in the direction of the bend in the motor housing. Sliding mode is thus used to change the trajectory of the wellbore. It is necessary to orient the bend in the steerable motor housing in the direction to which the wellbore operator desires to adjust the wellbore trajectory.

To my knowledge, in every steerable motor orienting technique known in the art, after the rotation of the drill string is stopped, the drill string is raised such that the drill bit is lifted off the bottom of the well. Lifting the drill string is performed to release the torque (and associated twist) in the drill string from the rotating drilling mode. After all the drill string torque is released, a measurement of the orientation of the motor housing bend is made, by using a device such as a measurement while drilling instrument or a steering tool, and the drill operator will then attempt to set the bend orientation by slowly rotating the drill string from the Earth's surface (using the Kelly or top drive) until the desired motor housing bend orientation is achieved. Then the drill string is lowered until the drill bit again contacts the bottom of the wellbore and again begins drilling the Earth formations. The drill bit, as previously explained, is rotated in these circumstances only by the steerable motor. As the drill bit begins drilling the Earth formations, however, reactive torque will be applied to the drill string in a direction opposite to the direction of rotation of the drill bit. Reactive torque can thus cause the drill string to rotate (by twisting) in

the opposite direction as the rotation of the drill bit, from the steerable motor housing upward, thus upsetting the selected orientation of the motor housing. The drill operator may have to lift the drill string, reset the orientation angle and lower the drill string several times before the reactive torque-adjusted motor orientation angle is along the desired angle.

To my knowledge, there are no techniques known in the art prior to the invention claimed in the captioned patent application that do not include the lifting of the drill bit off the bottom of the wellbore. In my opinion, the disclosure in Eppink et al., contrary to the assertion of the Examiner, only discloses an improvement to the techniques known in the art that includes using a retractable stabilizer and does not disclose alternating between sliding mode and rotating mode without lifting the drill bit off the bottom of the wellbore.

In my opinion, the Examiner has misapprehended the disclosure in Eppink et al. I do not agree that Eppink et al. discloses any method or associated system for drilling alternately between sliding and rotating with a steerable motor without lifting the drill bit. Eppink et al. only discloses steerable motor methods already known in the art as explained above, which necessarily include lifting the drill bit off the bottom of the well to orient the steerable motor. Such disclosure with respect to drilling with a steerable motor is in fact found directly in the Background section of Eppink et al. The invention presented by Eppink et al. is a retractable stabilizer for use with a bi-center drill bit. Steerable motor drilling is only referenced in Eppink et al. to explain an advantage of steerable motor drilling and conventional rotary drilling assemblies, namely, that such conventional assemblies can and preferably do include a so called "near-bit" stabilizer to act as a fulcrum. Using the retractable stabilizer as disclosed in Eppink et al. enables using a near bit stabilizer with a steerable motor. However, that is the extent of the disclosure of Eppink et al. Eppink et al. is completely silent on the issue of how the change from rotating mode to sliding mode is performed when using steerable motors to drill a wellbore.

All statements made herein of my own knowledge are true, and all statements made on information and belief are believed to be true. Further, these statements are made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

Tommy M. Warren

Date signed Jan 30 2006